

**Amendments to the Claims:**

The listing of the claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (currently amended) Ion accelerator system having an ionization chamber, an electrode arrangement, and a magnet arrangement, wherein

- the ionization chamber has an ion exit opening in a longitudinal direction, and is delimited by at least one side wall crosswise to the longitudinal direction, and wherein working gas can be introduced into the ionization chamber by way of an introduction opening that is spaced at a distance from the exit opening,
  
- the electrode arrangement contains at least one cathode and one anode, and generates an electrical field for accelerating positively charged working gas ions in the direction of the exit opening,

- the magnet arrangement in the ionization chamber generates a magnetic field that has, in the longitudinal direction, at least one longitudinal segment of a second type, having a magnetic field direction essentially parallel to the longitudinal direction, and an adjacent longitudinal segment of a first type, having a comparatively higher proportion of the field component perpendicular to the longitudinal direction,

- the wall distance between wall surfaces that stand opposite one another is less in the longitudinal segment of the second type than in the longitudinal segment of the first type,

~~characterized in that~~ wherein the wall progression in the longitudinal segment of the second type demonstrates a monotonously curved curvature towards the ionization chamber, in the longitudinal direction.

Claim 2 (currently amended): System according to claim 1, ~~characterized in that~~ wherein the minimal distance between walls

in the longitudinal segment of the second type is at least 15%, particularly at least 25%, less than the maximal distance between walls in the longitudinal segment of the first type.

Claim 3 (currently amended): System according to claim 1, ~~wherein or 2, characterized in that~~ longitudinal segments of the first and the second type alternately follow one another.

Claim 4 (currently amended): System according to ~~one of claims 1 to 3, characterized in that~~ claim 1, wherein a reversal of direction of the longitudinal component of the magnet occurs in a longitudinal segment of the first type.

Claim 5 (currently amended): System according to ~~one of claims 1 to 4, characterized in that~~ claim 1, wherein in a longitudinal segment of the second type, the chamber wall is formed at least partly by an intermediate electrode.

Claim 6 (currently amended): System according to ~~one of claims 1 to 5, characterized in that~~ claim 1, wherein the anode is arranged at the end of the ionization chamber that lies opposite the exit opening, in the longitudinal direction.

Claim 7 (currently amended): System according to ~~one of~~  
~~claims 1 to 6, characterized in that~~ claim 1, wherein the cathode  
is configured as a primary electron source and is arranged  
laterally offset with reference to the exit opening, outside of  
the ionization chamber.

Claim 8 (canceled).

Claim 9 (currently amended): System according to ~~one of~~  
~~claims 1 to 7, characterized in that~~ claim 1, wherein no external  
electron source is provided as a neutralizer or primary electron  
source.